

Attorney's Docket No.: 07402-039001

09/547061

X-hatching

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

Upon entry of this amendment, claims 1-13 and newly added claim 18 will remain in the action.

Allowable claims

Claims 5 and 6 were indicated to be allowable if rewritten in independent form.

Claim 5 has been rewritten in independent form, and claim 6 depends from claim 5. Applicants submit that claims 5 and 6 are allowable.

Section 103 rejections

Claims 1-4 and 7-13 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Panchou et al. (US 6,040,630, hereinafter "Panchou").

The Action states that the claimed island has not been claimed in a way such that one with skill in the art would understand how and to what degree it is structurally different to the prior art's island.

Applicants have amended the claims to recite that the insulating islands are interposed between the silver migration regions (220 in FIG. 2, 320 in FIG. 3) in the metal contact and the surface of the flip chip in order to prevent the formation of silver-contamination regions (222) in the flip chip electrode (206/306) (See page 6 of the specification).

Panchou does not disclose that the insulating layer (30) is interposed between a metal contact (12) and the flip chip (11) (See FIG. 4). Instead, the insulating layer (30) includes vias

Attorney's Docket No.: 07402-039001

(34) to accept the conductive bumps (14), and hence, the insulating layer (30) does not interfere with the conductive contacts between the conductive bump (14) and the contact (12) or between contact (12) and the flip chip (11). Also, Panchou does not describe silver migration regions extending from the conductive bumps (14) toward the flip chip surface through the contact (12).

Consider exemplary independent claim 1, as amended, which recites in relevant part:

"...a plurality of silver migration regions in the first conductive contact extending from the silver epoxy bond toward the surface of said semiconductor die; and
an insulating island interposed between said silver migration regions and the surface of said semiconductor die..."

Panchou does not teach or suggest providing an insulating island interposed between silver migration regions in a metal contact on a semiconductor die and the surface of the semiconductor die. Accordingly, Applicants submit that independent claims 1 and 9, and their dependencies, are allowable.

Attached is a marked-up version of the changes being made by the current amendment.

10/07/02 MON 17:26 FAX 8586785099

FISH & RICHARDSON P.C.

008

Attorney's Docket No.: 07402-039001


Applicant asks that all claims be allowed.

Please apply the amount of \$160 for the appeal fee and the amount of \$110 for the 1 month extension of time, and any other charges or credits, to Deposit Account No. 06-1050.

Respectfully submitted,

Date:

OCT 7, 2002


Kenyon S. Jenckes
Reg. No. 41,873

PTO Customer No. 20985



Fish & Richardson P.C.
4350 La Jolla Village Drive, Suite 500
San Diego, California 92122
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

10220028.doc

FAX COPY RECEIVED

OCT 07 2002

TECHNOLOGY CENTER 2800

Attorney's Docket No.: 07402-039001

Version with markings to show changes made

In the claims:

Claims 14-17 have been cancelled.

Claims 1, 5, and 9 have been amended as follows:

1. (Twice Amended) A semiconductor interconnection system, comprising:

a semiconductor die;

first and second conductive contacts, said first conductive contact coupled to a surface of said semiconductor die, and said second conductive contact coupled to an external structure;

a silver epoxy bond interposed between said first and second conductive contacts, said epoxy bond providing electrical and mechanical interconnection between said semiconductor die and said external structure;

a plurality of silver migration regions in the first conductive contact extending from the silver epoxy bond toward the surface of said semiconductor die; and

an insulating island [configured to prevent migration of silver from said silver epoxy bond to said semiconductor die through said first conductive contact] interposed between said silver migration regions and the surface of said semiconductor die,

wherein the first conductive contact is in contact with the surface of said semiconductor die in a region adjacent the insulating island.

5. (Amended) A semiconductor interconnection [The] system [of claim 1, further], comprising:

Attorney's Docket No.: 07402-039001

a semiconductor die;

first and second conductive contacts, said first conductive contact coupled to a surface of said semiconductor die, and said second conductive contact coupled to an external structure;

a silver epoxy bond interposed between said first and second conductive contacts, said epoxy bond providing electrical and mechanical interconnection between said semiconductor die and said external structure; and

an insulating island configured to prevent migration of silver from said silver epoxy bond to said semiconductor die through said first conductive contact; and

a conductive electrode heavily doped with p-type material at the surface of said semiconductor die to provide electrical connection between said semiconductor die and said external structure.

9. (Twice Amended) A semiconductor flip-chip, comprising:

a semiconductor die having a plurality of conductive contacts;

a plurality of epoxy bonds having a metallic component, said epoxy bonds configured to provide interconnection between said semiconductor die and an external structure, said plurality of epoxy bonds selectively applied to said plurality of conductive contacts on said semiconductor die and corresponding conductive contacts on the external structure;

a plurality of metallic component migration regions in each of said plurality of conductive contacts; and

an insulating island corresponding to each of the plurality of epoxy bonds, each insulating island [coupled to] interposed between one of said plurality of conductive contacts and a surface of the semiconductor die [, each insulating island

10/07/02 MON 17:27 FAX 8586785099

FISH & RICHARDSON P.C.

011

Attorney's Docket No.: 07402-039001

configured to prevent migration of said metallic substance from one of said plurality of epoxy bonds to said semiconductor die through said plurality of conductive contacts),

wherein each of said plurality of conductive contacts is in contact with the surface of the semiconductor die in a region adjacent the corresponding insulating island.

New claim 18 has been added.